



# Glass Reuse Plan

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*November 13, 2020*



**CITY OF TUCSON  
ENVIRONMENTAL  
SERVICES**

[WWW.TUCSONAZ.GOV/ESD](http://WWW.TUCSONAZ.GOV/ESD)

# INTRODUCTION

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## Policy Direction:

The City of Tucson, Plan Tucson goal(s) are to encourage new and existing City infrastructure, facilities, and operations to use best energy efficiency technologies and energy conservation practices and strive for net zero energy facilities.

In addition, the Mayor and Council has directed staff to develop alternative waste reduction alternatives and solutions to support the City's long-term sustainability and climate action goals to achieve carbon neutrality by 2030 and zero waste by 2050 (Resolution 23222). The planning, development and implementation of a phased approach on transitioning glass recycling to a local market glass reuse program enables the Department to meet this policy directive by diverting and reusing glass for various uses and purposes resulting in multiple benefits.

## Removing glass from the residential curbside recycling program:

The removal of the glass from the City's residential blue bin curbside recycling program allows the Department to transition from glass recycling to glass reuse through a network of community wide glass drop-off locations.

## Transforming Recycling Glass:

By removing glass from curbside collection, the Environmental and General Services Department (EGSD) will reduce processing costs at the Materials Recovery Facility (MRF), while implementing a community-wide glass collection program that keeps glass for reuse locally while reducing our environmental footprint.

Limited market value for glass reduces our overall recycling commodity prices which affects our ability to recover costs through the sale of recycling commodities. The reuse of glass locally provides us with more program control, creates more opportunities for circular economies while reducing Green House Gas emissions.





# 1. BACKGROUND

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Each year the City of Tucson collects approximately 5,330 tons of glass through the City's residential curbside recycling program. Glass is processed at the Republic Services MRF where it is sorted and sent to Strategic Materials in Phoenix, AZ (121 miles). Strategic Materials uses glass for sandblasting, but most is transported to Mexicali, Mexico where it is used by beverage bottlers.

Since 2018, tipping fees and other costs assessed by Republic Services have increased significantly. In FY 2020, the processing of 5,300 tons of glass, represented a cost of \$567,100 (approximately \$107/ton). Glass, as a recyclable commodity in the Tucson region has little or no market value and thus does not generate any revenue to offset the processing costs unlike other recyclables that are in demand as feedstock for new products.

By removing glass from the curbside program and asking residents to drop-off glass, we can reduce recycling processing costs and use these projected savings to cover a glass reuse program. EGSD will provide crushed glass to the Department of Transportation and Mobility and other City departments for use in sandbags and as aggregate for construction projects. This would result in a cost avoidance opportunity.

In addition to cost avoidance, transitioning to a glass reuse strategy will contribute to the reduction of our environmental footprint by utilizing reused glass locally and avoiding long-haul transportation costs. The transition also moves the City to a preferred waste diversion option. Within the solid waste management hierarchy, the reuse of materials is higher on the hierarchy than recycling.

Calculated yearly GHG emissions associated with 5,300 tons of glass:

Glass Recycling:	-1,484 MTCO <sub>2</sub> e
Glass Reuse:	-2,809 MTCO <sub>2</sub> e
Sand Production:	954 MTCO <sub>2</sub> e
Transportation of glass to final destination-Mexicali:	250 MTCO <sub>2</sub> e
2-Ton per Glass Crusher:	0.0038 MTCO <sub>2</sub> e

***Net GHG in MTCO<sub>2</sub>e by transitioning from glass recycling to glass reuse (sand):***

- ***-4013 MTCO<sub>2</sub>e***
- ***Represents 69% drop in GHG emissions***

The transition to glass reuse will allow EGSD to explore future local reuse or recycling options for other products that currently find their way into our waste stream. EGSD will engage the community in discussion to identify how Tucsonans can take actions that improve our environment and sustainability. EGSD will continue to develop and pursue other local options

to reuse and recycle materials. This positions the City to continue to reduce the carbon footprint of our community.

EGSD has identified 22 City-owned facilities to deploy “Glass Only” Collection Bins. Initially, EGSD will deliver “Glass Only” containers to each of the seven established Neighborhood Recycling Centers (NRC) which are located in each Ward and at the Los Reales Landfill.

A “Glass Only” container will also be delivered to Ward 6 per Council Office Request. Wards 2, 4, and 5 are currently established NRC sites.

The additional sites are located at various city facilities with regular public access such as Recreation Centers as they are considered suitable collection sites and are located throughout the community.

These twenty “Glass Only” drop off sites provide city residents with access to a collection site within a two-mile radius (see attached map for locations and addresses). The success of the residential glass reuse program will be monitored and staff will provide updates to Mayor and Council.



## 2. IMPLEMENTATION (COMMERCIAL)

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In December 2019, a small glass crusher was purchased and set up at the Ward 6 Council Office. EGSD staff reached out to a few local bars who were given a 95-gallon container for glass which was picked up, delivered to Ward 6, and crushed. Currently there are six businesses that are collecting glass for reuse.

To further expand this commercial pilot glass reuse program, EGSD will reach out to our current customers that may be considered high glass generators (hospitality and event industry) in the Downtown, 4th Avenue, and University area to see if there is interest in participating in this pilot program.

Staff will also meet with the Downtown Tucson Partnership, Main Gate, and Fourth Avenue Merchants Association to introduce the pilot program and gauge interest. Each interested business will be visited to determine how best to provide the service, i.e. individual containers or a shared metal container.

During the commercial glass only reuse pilot program, the service will be provided at no charge to businesses. As data is gathered to see how much glass is being collected and reused and how it impacts the trash disposal cost for the business, a rate schedule will be identified.

Due to the heavy weight of glass, diverting it from trash should allow businesses to reduce their trash capacity needs and/or frequency of collection resulting in a cost savings. The commercial glass reuse pilot program will continue for one year with quarterly assessments to identify issues and adjust collection processes. Staff will prepare a report to Mayor and Council with updates on the pilot commercial reuse program.



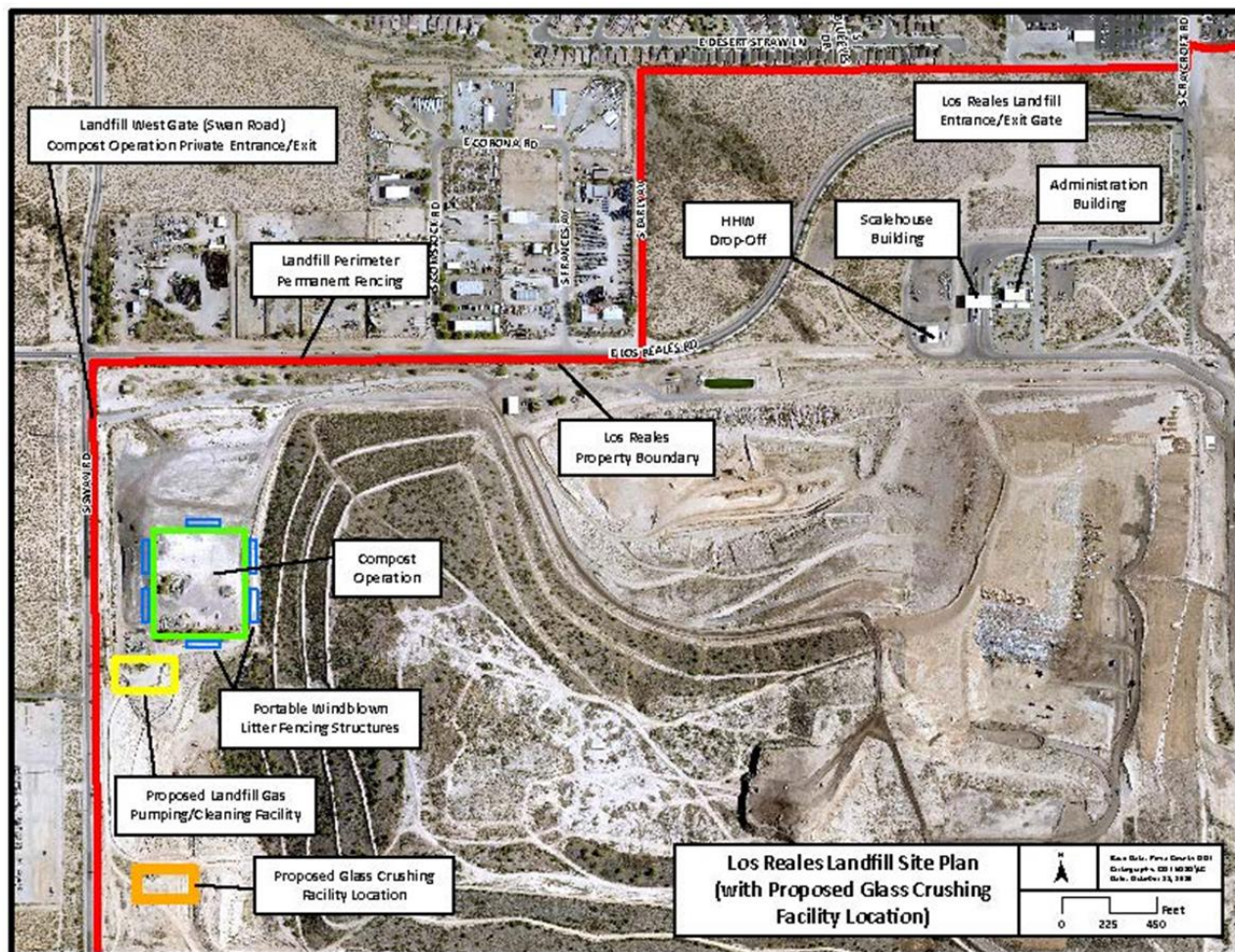
### 3. OPERATING PLAN

EGSD staff will collect the glass from all the designated collection sites. The glass will be taken to the Los Reales Landfill for processing and crushing. A special glass processing facility would be placed in operation at the southwest corner of Los Reales Landfill to mitigate the effects of dust and noise.

Crushed glass will be made available to the Department of Transportation and Mobility (DTM) for their yearly “Splash Operation” and other city departments.

Crushed glass will also be used to supplement the City’s composting program by providing granular material to reduce the coagulation of the compost material and to enhance water flow.

### Site Map



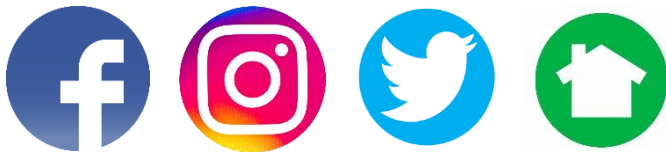
## 4. EDUCATION AND OUTREACH

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The primary objective is to notify and inform residents of the removal of glass from the City's curbside recycling program and identify drop off locations for the new Glass Reuse Program. In addition, City of Tucson commercial customers in the downtown area will be notified of the pilot commercial reuse program.

Residents will be notified of the changes to the curbside recycling program which will be effective on February 1, 2021. EGSD recommends this date to avoid confusion during the holidays by making a significant change to the list of accepted materials. Residents will be provided with a sticker showing what is recyclable in the curbside program which can be attached to their 95-gallon container lid.

A social media campaign will be conducted using all platforms available. Over the last year, EGSD has developed its social media presence with high engagement and shares. On Facebook, EGSD followers have doubled since 2019 and often reaches more than 4,000 followers per post. Additionally, the EGSD Recycle Coach app has nearly 50,000 users with approximately 1.8 million interactions annually.



The messages about glass recycling and drop-off sites will be part of the EGSD's on-going messaging about services for residents. The primary message for removing glass from the curbside program will emphasize the environmental and financial benefits to the community by keeping and reusing glass locally. It will include development of short videos and graphics that discuss environmental benefits, options for upcycling, and suggestions for how we can all reduce our use of glass.

As EGSD begins the bin monitoring and tagging, containers with glass will receive a reminder but will not be rejected for collection.

Drop-off collection bins will be designed with distinctive colors and signage to reduce contamination. The metal dumpsters used will be retrofitted to minimize contamination.

## Outreach timeline:

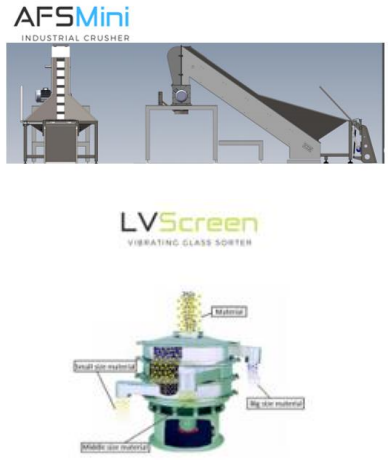

11/17/20	• Glass Reuse Plan Presented to Mayor & Council
11/18/20	• News Releases and Social Posts
11/18/20-02/18/21	• Weekly Social Post & Digital/Newspaper Ads
012/2020	• Story Map with Locations available to the Public
012/2020	• Webpage Available to the Public
1/21	• Bill Insert with Map and Information re: Glass Collection
1/4/21	• Direct Mail to Residential Customers with Sticker for Bins and Glass Fact Sheet
01/12/21	• Virtual Town Hall @ 5:30 PM
01/15/21	• Virtual Town Hall @ 10:00 AM
01/21/21	• Virtual Town Hall @ 6:30 PM
02/01/21	• Glass Officially Removed

In addition to the scheduled Town Hall meetings, EGSD will reach out to registered Neighborhood Associations to request time on agendas to present the program and get feedback from residents. Staff will make similar presentations to other community organizations that request them.



## 5. GLASS REUSE/CRUSHING EQUIPMENT

EGSD identified the equipment needed to effectively operate a glass crushing program at Los Reales Landfill.

Expleco AFS Mini, 2 Tph, Industrial Glass Crusher equipped with a LVScreen Vibrating Glass Sorter (or approved equal)	\$130,000	 <p>The image shows two pieces of equipment. The top image is a diagram of the AFS Mini Industrial Crusher, which is a large, grey, industrial-grade machine with a hopper and a conveyor. The bottom image is a diagram of the LVScreen Vibrating Glass Sorter, which is a smaller, green and blue machine with a hopper and a conveyor. Labels indicate different material sizes: 'Material' at the top, 'Small size material' on the left, 'Medium size material' in the middle, and 'Big size material' on the right.</p>
20-3 CY "Glass Only" Reuse Bins	\$15,000	 <p>The image shows a large, blue, rectangular bin with a yellow lid and a black handle. It is a 20-3 CY "Glass Only" Reuse Bin.</p>

## Proposed Site Locations and Map

- 7 Existing NRC Sites
- Ward 6 Council Office – 3202 E 1<sup>st</sup> St
- Donna Liggins Center – 2160 N 6<sup>th</sup> Ave
- Quincie Douglas Center – 1575 E 36<sup>th</sup> St
- Mission Manor Park – 5900 S 12<sup>th</sup> Ave
- Golf Links Sports Park – 2400 S Craycroft Rd
- Ft. Lowell Park – 2998 N Craycroft Rd
- Armory Senior Center – 220 S 5<sup>th</sup> Ave
- Westside Police Substation – 1310 W Miracle Mile
- Santa Rosa Center – 1080 S 10<sup>th</sup> Ave
- El Rio Center – 1390 W Speedway Blvd
- Eastside Police Substation (Miller/Golf Links) – 9670 E Golf Links Rd
- Archer Center – 1665 S La Cholla Blvd
- El Pueblo Center – 101 W Irvington Rd
- Purple Heart Park – 9800 E Rita Rd
- Udall Center – 7200 E Tanque Verde Rd

